STS™

SUPER TURBINE SUCTION

Dual Stage Dry Vacuum System with the Cyclonic Action Separator (CAS)

STS-15™ with 20 GALLON CAS™
P/N 54130
STS-30™ with 20 GALLON CAS™
P/N 54132

USER'S MANUAL

ISO 9001
ISO 13485
FDA-GMP COMPLIANT

AIR TECHNIQUES INC

TABLE OF CONTENTS

Description	Page
Congratulations	2
Warranty	3
On-Line Warranty Registration	3
Safety Instructions	3
Sizing Guide	4
Key Parts Identification	4
Specifications	5
Site Requirements	5
Product Specifications	5
Dimensions	5
STS System Configurations	6
Operating Information	7
Pipe Flow Schematic	7
Installation Information	8
Installation Procedures	9
Single STS (STS-15) PVC Hose Installation	9
Dual STS (STS-30) Hose Installation	10
Electrical Connections	12
Maintenance	13
Trouble Shooting	18
Accessories/Options	18
Installation Accessory Kits	19

CONGRATULATIONS

Congratulations on the purchase of your new STS™ Dual Stage Dry Vacuum System (Super Turbine Suction). The STS™ is a medical dry vacuum pump that produces high-volume air flow with multiple users online designed for use in a dental facility. The CAS™ (Cyclonic Action Separator) tank ensures that no liquids or foams enter the vacuum pump. The relief valve is easily accessible on the CAS™. The patented vacuum relief valve maintains a constant uniform vacuum. The powerful 3 phase motor, with a highly reliable contactor and powerful transformer can be depended upon to start every time. Your STS™ vacuum system and CAS™ separator tank are easily installed and maintained.

This manual provides operation, installation, and maintenance instructions for the support of the STS Dual Stage Dry Vacuum System. Review and follow the guidelines included in this User Manual to ensure that the system provides the highest level of service.

WARRANTY

The STS and CAS are warranted to be free from defects in material and workmanship from the date of installation for a period of thirty-six (36) months.

Any item returned to our factory through an Air Techniques Authorized Dealer, will be repaired or replaced at our option at no charge provided that our inspection shall indicate it to have been defective. Dealer labor, shipping and handling charges are not covered by this warranty.

This warranty does not apply to damage due to shipping, misuse, careless handling or repairs by other than authorized service personnel. Warranty is void if equipment is installed or serviced by other than dealer service personnel authorized by Air Techniques. Air Techniques, Inc. is not liable for indirect or consequential damages or loss of any nature in connection with this equipment.

This warranty is in lieu of all other warranties expressed or implied. No representative or person is authorized to assume for us any liability in connection with the sale of our equipment.

ON-LINE WARRANTY REGISTRATION

Quickly and easily register your new STS on-line. Just have your product model and serial numbers available. Then go to the Air Techniques web site, **www.airtechniques.com**, click the **warranty registration** link and complete the registration form. This on-line registration ensures a record for the warranty period and helps Air Techniques keep you informed of product updates and other valuable information.

SAFETY INSTRUCTIONS

Use of the STS not in conformance with the instructions specified in this manual may result in permanent failure of the unit.

WARNING: To prevent fire or electrical shock, do not expose this appliance to rain in or moisture.

All user serviceable items are described in the maintenance section.

Manufacturing date code on serial number label is in the format Month YYYY.

ATTENTION USERS:

Alerts users to important Operating and Maintenance instructions. Read carefully to avoid any problems.

Warns users that uninsulated voltage within the unit may be of sufficient magnitude to cause electric shock.

I ON
O OFF

Indicates the ON and OFF position for the Equipment power switch.

Indicates protective Earth Ground for the Equipment power switch.

Indicates type B equipment in accordance with IEC 601-1

Warns users of hot surfaces. There is a danger of burns. Work near these surfaces only after they have cooled down.

CLASSIFIED
C UL US

MEDICAL ELECTRICAL EQUIPMENT

WITH RESPECT TO ELECTRICAL SHOCK, FIRE, MECHANICAL AND OTHER SPECIFIED HAZARDS ONLY
IN ACCORDANCE WITH UL-60601-1, CAN/CSA C22.2 NO.601.1
66CA

SIZING GUIDE

Choosing the correct size STS to meet practice depends on the number of air users and the anticipated air demand. To assure optimum operation, the demands should not exceed the number of air handpiece users shown below. Each chart lists the number of simultaneous High Volume Evacuators (HVEs) and Saliva Ejectors (SEs) that can be used in respective systems.

STS-15 SYSTEM
(with 1 20-gallon CAS)

HVE's	+	SE's	HVE's	+	SE's
15	+	0	7	+	16
14	+	2	6	+	18
13	+	4	5	+	20
12	+	6	4	+	22
11	+	8	3	+	24
10	+	10	2	+	26
9	+	12	1	+	28
8	+	14	0	+	30

STS-30 SYSTEM
(2 STS-15's in Tandem with 1 20-gallon CAS)

HVE's	+	SE's	HVE's	+	SE's	HVE's	+	SE's	HVE's	+	SE's
30	+	0	22	+	16	14	+	32	6	+	48
29	+	2	21	+	18	13	+	34	5	+	50
28	+	4	20	+	20	12	+	36	4	+	52
27	+	6	19	+	22	11	+	38	3	+	54
26	+	8	18	+	24	10	+	40	2	+	56
25	+	10	17	+	26	9	+	42	1	+	58
24	+	12	16	+	28	8	+	44	0	+	60
23	+	14	15	+	30	7	+	46			

KEY PARTS IDENTIFICATION

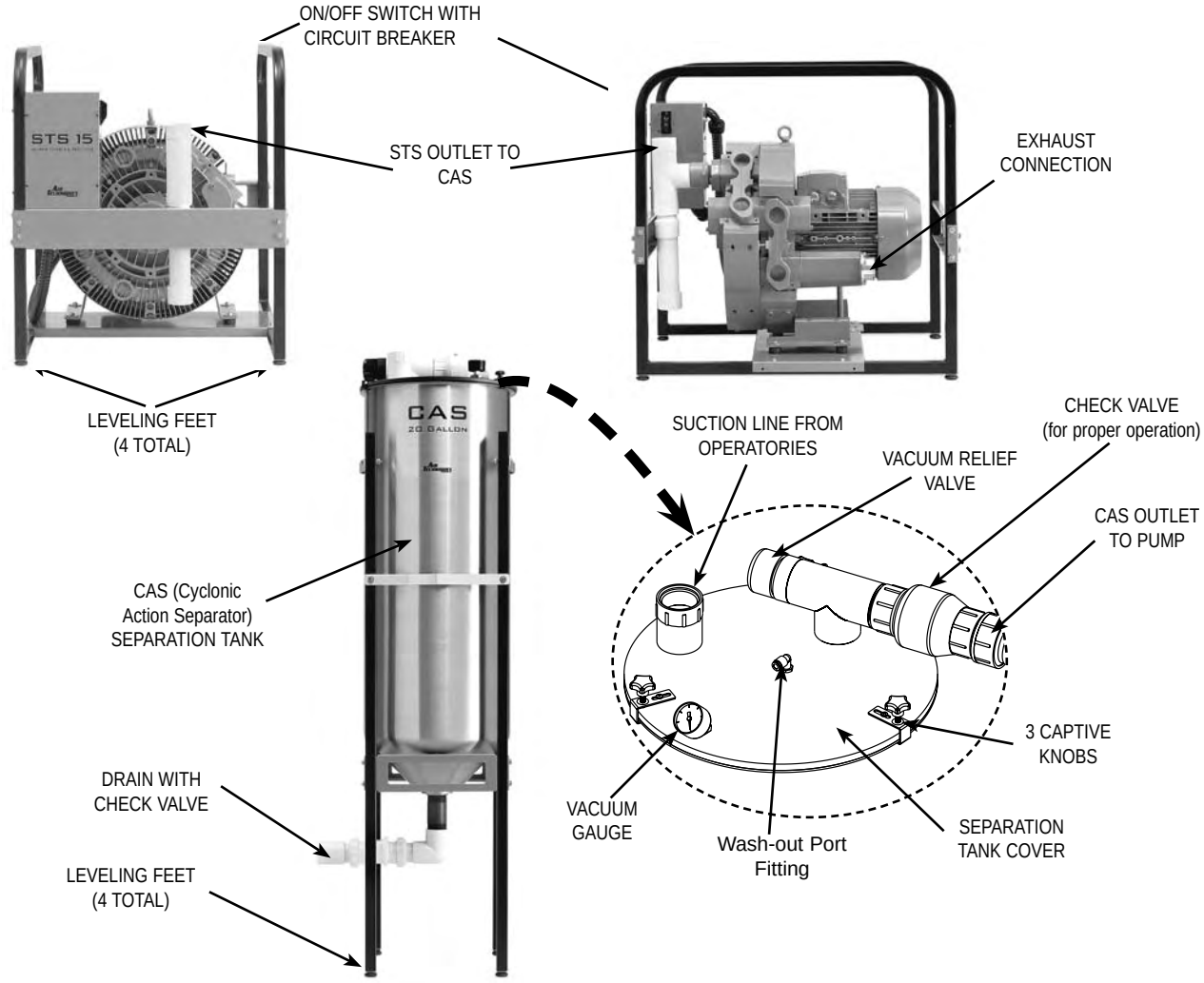


Figure 1. STS-15 and STS-30 with 20-Gallon CAS Main Parts Location

SITE REQUIREMENTS

ELECTRICAL	SINGLE (STS-15)	DUAL (STS-30)
Minimum Circuit Breaker Rating	30A	30A (Qty 2)
Wire Size AWG Minimum Gauge	#10	#10AWG (Qty 2)
Receptacle	Hardwired	Hardwired
PLUMBING		
Exhaust Vent Pipe	3-Inch Metal Pipe	3-Inch Metal Pipe (Qty 2)
Suction Line		
Riser Diameter ID	1/2 Inch	1/2 Inch
Branch Line Diameter ID Minimum	1-1/2 to 2 Inches	2 to 3 Inches
Main Line Diameter ID	2 to 3 Inches	3 to 4 Inches
End Fitting at STS	1-1/2 Inch FNPT	1-1/2 Inch FNPT
Drain Line	1-1/2 Inch Schedule 40 Pipe	1-1/2 Inch Schedule 40 Pipe
Wash-Out Line	1/2-Inch FNPT Shut-off Valve	1/2-Inch FNPT Shut-off Valve
Ambient Temperature	40 to 104°F (5 to 40°C)	40 to 104°F (5 to 40°C)

PRODUCT SPECIFICATIONS

ELECTRICAL	SINGLE (STS-3)	DUAL (STS-6)
Voltage (Minimum/Maximum)	200/250	200/250
Full Load	15 Amps	30 Amps
Starting Load	100 Amps	200 Amps
Frequency	60 Hz	60 Hz
Maximum Vacuum	17 InHg	17 InHg
Preset Vacuum Level	10 InHg	10 InHg
CAS SPECIFICATIONS		
Working Liquid Capacity:	20 Gallons plus adequate capacity for foam	20 Gallons plus adequate capacity for foam
Tank Material	304 Stainless Steel	304 Stainless Steel
ENVIRONMENTAL CONDITIONS		
Operating Temperature	40 to 104°F (5 to 40°C) with PVC vent pipe	40 to 104°F (5 to 40°C) with PVC vent pipe
Storage Temperature	0 to 150°F (-18 to 66°C)	0 to 150°F (-18 to 66°C)
Relative Humidity	90% (no condensation)	90% (no condensation)
Exhaust Fan Requirements	800 CFM Minimum	1600 CFM Minimum

IEC601-1 CLASSIFICATION

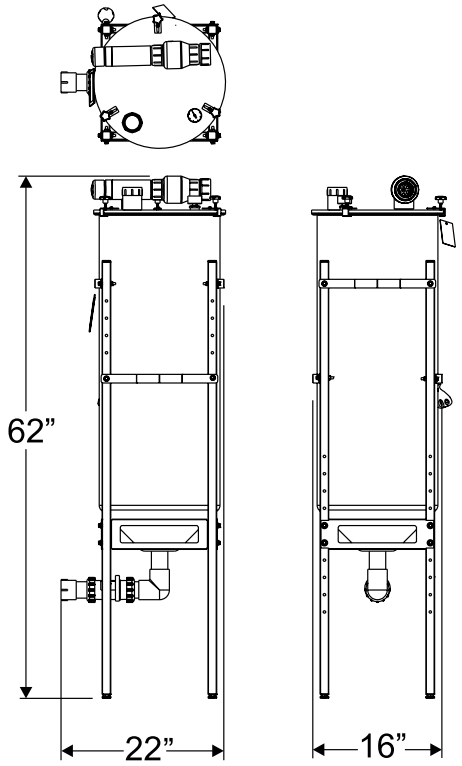
Class 1, Type B, Transportable, Continuous Operation
Equipment not suitable for use in the presence of flammable anaesthetic mixture(s).
Protection against ingress of liquids -Ordinary

DIMENSIONS

	SINGLE (STS-15)				DUAL (Two STS-30 Pumps Stacked)			
	Weight	Width	Depth	Height	Weight	Width	Depth	Height
STS	235 lbs.	24 in.	29 in.	28 in.	470 lbs.	24 in.	29 in.	56 in.
20-Gallon CAS	70 lbs.	22 in.	16 in.	62 in.	70 lbs.	22 in.	16 in.	16 in.

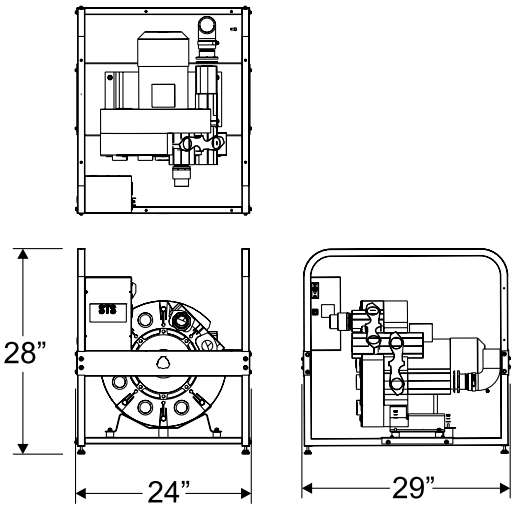
STS-15/STS-30 Configuration Dimensions.

Figure 2 shows the space requirements for STS-15 and STS-30 model configuration installations. Please note that all CAS heights can be increased or decreased by 8 inches using the adjusting holes in the 4-rail support assembly.



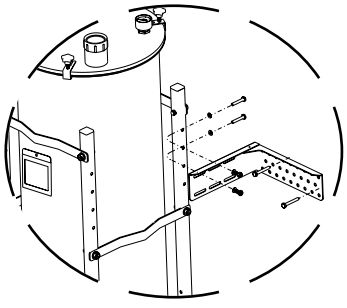
20 GALLON CAS, P/N 54170
(Used for STS-15 and STS-30)

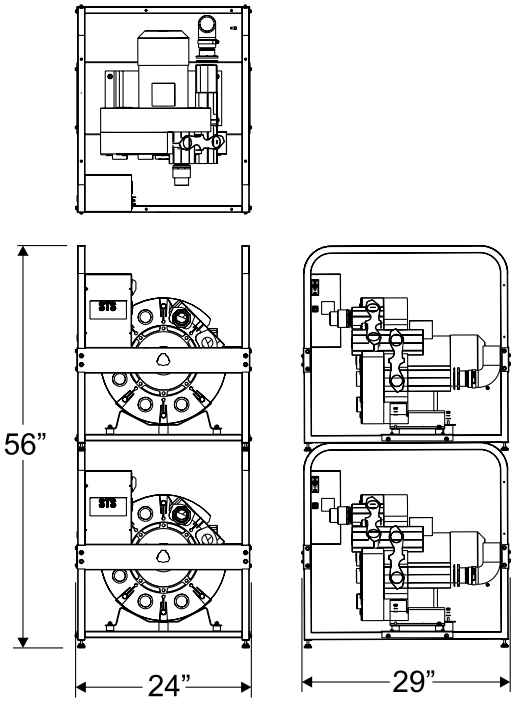
See Detail A



STS-15, P/N 54110 Configuration

Detail A-
Typical wall bracket installation.





2 STS-15 Pumps Stacked Together Used in STS-30
P/N 54132 Configurations

The 20 gallon CAS **must always** be bolted to the wall with brackets provided in the Tank Accessory Kit. See page 17.

20 gallon CAS tanks **cannot** be stacked on top of a STS-15 pump.

Figure 2. STS-15 and STS-30 with 20 Gallon CAS Configuration Dimensions

Any time the power to the STS™ is turned OFF the CAS tank will automatically drain.

- The STS may be turned “ON/OFF” from a single, convenient location within the dental office using a Remote Control Panel. Remote wiring must be done by a licensed electrician in accordance with local codes.
- The vacuum level is factory preset at 10 in Hg (inches of mercury). This is the reading on the gauge when all HVE’s and SE’s are CLOSED. If this setting needs to be adjusted contact your dealer to readjust the setting.
- The unit is capable of running continuously. To conserve electricity, the system may be turned off when not in use.
- The CAS separation tank has been designed to collect the fluids evacuated during a normal operating day. If an excessive amount of fluids are collected in the CAS, the protective mechanism in the CAS will interrupt the vacuum flow in order for the tank to automatically drain. This process takes approximately 60 seconds. To restore the vacuum to full operation turn OFF the power to the STS for a minimum of 10 seconds and then turn back ON.
- Perform the daily maintenance procedures to Clean Vacuum Lines and Washout Tank.
- Turn the power OFF at the end of the day. This will drain collected liquids in the CAS separation tank.

PIPE FLOW SCHEMATIC

Figure 3 shows the overall functional flow of STS systems with a CAS tank. Inlet and outlet connections to the tank is made at the top of the tank. This arrangement provides flexibility in installation, makes maintenance easier and adds to overall tank efficiency.

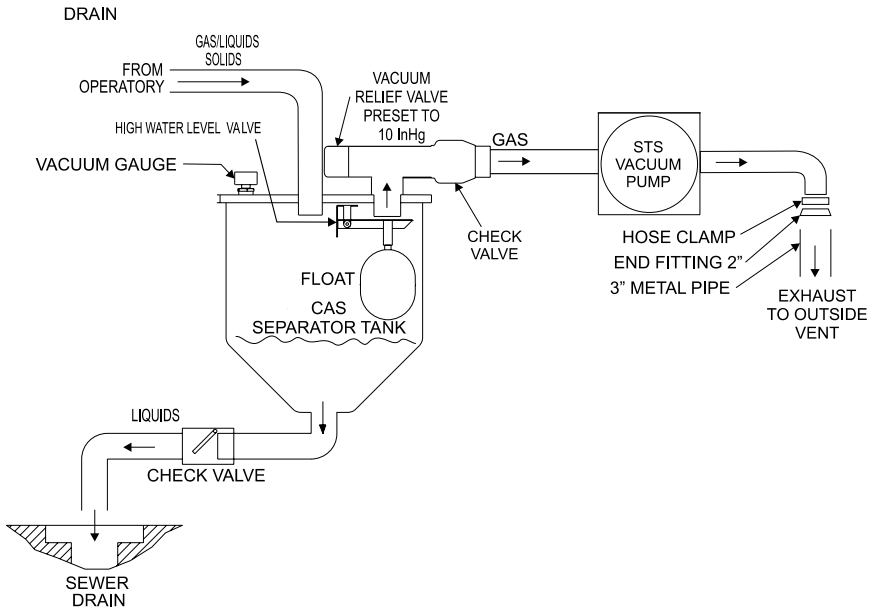


Figure 3. STS with 20 Gallon CAS Functional Flow Diagram

INSTALLATION INFORMATION

TEMPERATURE CONTROL

The STS unit must be used in a controlled temperature environment. Maintain equipment room temperature between 40 and 105 degrees Fahrenheit. Adequate forced ventilation must be provided across the unit by placing an appropriate exhaust fan opposite an equivalent air intake vent. The fan should be higher that the associated intake vent. Recommended minimum exhaust fan requirements are 800 CFM for STS-15 and 1600 CFM for STS-30

ELECTRICAL

Before connecting the STS to the facilities plumbing complete the following steps:

1. Measure and record the VAC between each leg and ground. If all measurements are equal skip to step 3, if not continue with the next step.
2. Two of the three legs must be equal to use the STS-15. The two equal legs must supply power to the transformer (consult the STS ELECTRICAL SCHEMATIC, Page 12). The transformer is powered with the black and red 18 gauge wires.
3. Three phase motors can spin in the clockwise and counterclockwise direction. Momentarily switch the motor ON and ensure that air is flowing out of the motors exhaust fitting at the rear of the unit. If the unit is running properly continue with the PLUMBING section below, if not continue to the next step.
4. Turn the power switch OFF. Switch any two of the three input power lines and repeat step 3.

PLUMBING

For new installations it is recommended to follow the following guidelines:

1. Suction line from the operatories to be a minimum of 2 inches in diameter and must be sloped (1/4 inch minimum for every 10 feet) toward the separation tank. The suction line should not have any sharp right angle bends.
2. The suction line should be connected to the CAS separation tank with a short run of 1-1/2 inch diameter flexible tubing.
3. The STS system can replace turbine type pumps with larger diameter piping in existing installations.
4. The drain on the base of the separation tank must be connected to an open floor drain capable of handling 20 gallons per minute. Use a drain pipe size 1-1/2 inch schedule 40 minimum.
5. The drain line should be a short run with a minimum slope of ¼ inch for every 10 feet toward the drain (avoid any sharp right angle bends).
6. The vent line should be a 3-inch diameter pipe for a single STS and two 3-inch diameter pipes for a dual system. The vent should be sloped ¼ inch for every 10 feet towards the pump. Vent line must be capable of handling vapors and liquids and needs to terminate in a 2-inch end fitting.
7. The outside vent must be protected from rain and animals.
8. A 2-inch flexible air exhaust hose is provided to connect to the 3-inch diameter exhaust (vent), which must terminate with a 2-inch end fitting at the pump. Hose clamps are provided to secure hose to exhaust (vent) pipe.
9. Wash-out water supplied via 1/2” copper tubing terminated with a 1/2” FNPT shut-off valve providing water pressure between 20 and 100 psi.
10. Wash-out port on the CAS cover is a 3/8" push to connect elbow that connects to the water supply via supplied 10 foot 3/8” Poly tubing and 1/2" x 3/8" push to connect adapter.
11. Refer to pages 9 through 11 for mounting and securing instructions.

SINGLE STS (STS-15) PVC HOSE INSTALLATION.

Note: Each kit provides the required hoses, clamps adapters and wall brackets. No schedule 40 PVC pipe is included. Refer to page 17 for the contents of each kit. If more than 15 feet of hose is needed, order P/N 54118 (order by the foot).

Installation Accessory Packs. Figure 4 shows the pipe and hose connections required for all STS configuration installations using accessory packs as follows:.

CAS Tank Accessory Pack, P/N 54135 - used to make the following connections:

Between the suction line and CAS tank. See item (1) on Figure 4.

Between the CAS tank and STS pump. See item (2) on Figure 4.

Between the CAS tank and drain line. See item (3) on Figure 4.

STS Pump Accessory Pack, P/N 54468 - supplied with each STS pump, used to connect the pump to the facility vent line. See item (4) on Figure 4.

Connection Procedure. Installation of a single STS model configurations consists of making connections between a single 20 gallon CAS tank, P/N 54170, and a STS pump, P/N 54110. Refer to Figure 4 for the connection diagram and perform the following procedure.

1. Refer to Figure 2 and determine the footprint dimensions and connection requirements for the installation. Place the CAS tank and STS pump in position.
2. Install right and left side wall brackets to the CAS and secure the CAS tank to the wall by bolting with supplied lag bolts.
3. Measure and record distance between each connection point.
4. Cut the supplied hose to the length required for each connection.
5. Using industry standard techniques, install pipe to hose adapters as shown in Pipe Connection Diagram Figure 4.
6. Install hoses and secure with associated clamps.

LEGEND

#	Included in supplied accessory packs.
*	Not Included

REQUIRED CONNECTIONS

(1)	CAS tank suction input to facility suction line
(2)	CAS tank pump outlet to STS pump inlet
(3)	CAS tank drain to facility drain line
(4)	STS pump to the facility vent line

Notes:

The CAS accessory kit comes with 15 feet of 1-1/2" Black Flex PVC hose. Cut hose to the length required for the following connections.

1. Suction line to CAS
2. Pump to CAS
3. CAS to Drain.

If more than 15 feet of hose is needed, please order P/N 54118 (order per foot).

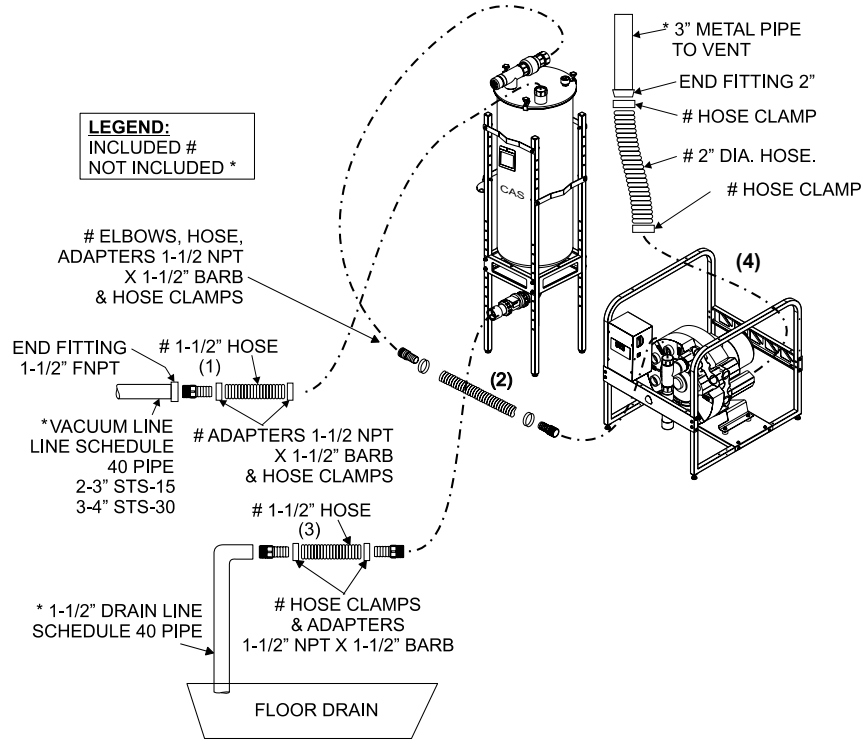

LEGEND:
INCLUDED #
NOT INCLUDED *
* 3" METAL PIPE TO VENT
END FITTING 2"
HOSE CLAMP
2" DIA. HOSE.
HOSE CLAMP
(4)
ELBOWS, HOSE, ADAPTERS 1-1/2 NPT X 1-1/2" BARB & HOSE CLAMPS
END FITTING 1-1/2" FNPT
1-1/2" HOSE (1)
(2)
*VACUUM LINE LINE SCHEDULE 40 PIPE 2-3" STS-15 3-4" STS-30
ADAPTERS 1-1/2 NPT X 1-1/2" BARB & HOSE CLAMPS
1-1/2" HOSE (3)
* 1-1/2" DRAIN LINE SCHEDULE 40 PIPE
# HOSE CLAMPS & ADAPTERS 1-1/2" NPT X 1-1/2" BARB
FLOOR DRAIN

Figure 4. STS Pump and CAS Tank Pipe Connection Diagram

DUAL STS (STS-30) PVC HOSE INSTALLATION.

Note: Each kit provides the required hoses, clamps and adapters. No schedule 40 PVC pipe is included. Refer to page 17 for the contents of each kit. If more than 15 feet of hose is needed, order P/N 54118 (order by the foot)

Installation Accessory Packs . Figure 5 shows the pipe and hose connections required for a dual STS configuration installation while Figure 4 shows the other necessary connections. The PVC hose installation is accomplished using accessory packs as follows:

CAS Tank Accessory Pack, P/N 54135 - used to make the following connections:

Between the suction line and CAS tank. See item (1) on Figure 4.

Between the CAS tank and drain line. See item (2) on Figure 4.

Between the CAS tank and combined STS pumps. See item (A) on Figure 5.

STS Pump Accessory Pack, P/N 54468 - used to connect each pump to the facility vent line. See item (4) on Figure 4.

STS Dual System Accessory Kit; P/N 54400 - used to connect two STS pumps together either side-by-side or stacked. See Figure 5.

Connection Procedure. Installation of the dual STS model configuration consists of making connections between a single 20 gallon CAS tank P/N 54170, and two STS pumps, P/N 54110. The associated pumps can be stacked or installed side-by- side depending on the size of the installation site. When stacking the two STS pumps, refer to Figure 6 showing the method to secure the pumps. In any case, the hose connections between the suction line and CAS tank, the CAS tank and drain line and pump to the facility vent line are identical as shown by Figure 5. Use the STS™ Dual System Accessory Kit; P/N 54400 to connect the two STS pumps together for connection to the CAS tank as shown by Figure 5. Refer to Figures 4, 5 and 6 and perform the following procedure.

1. Install check valves supplied in Dual System Accessory Kit; P/N 54400, on both pumps as shown by Figure 5.
2. Refer to Figure 2 and determine the installation footprint dimension and connection requirements. Place the CAS tank and STS pumps in position.
3. If installing side-by-side configuration, proceed to step 6. If stacking, perform step 4.

   Note: Make sure to bolt or secure installation to the floor or wall when stacking STS pumps.

4. Stack the two STS pumps as shown by Figure 6 and secure the pumps together using supplied hardware.
5. Refer to Figure 2 and secure the CAS tank to the wall using supplied hardware.
6. Measure and record distance between each connection point as shown in Figure 5.
7. Cut the supplied hose to the length required for each connection.
8. Using industry standard techniques, install pipe to hose adapters as shown in Figures 4 and 5.
9. Install hoses and secure with associated clamps.

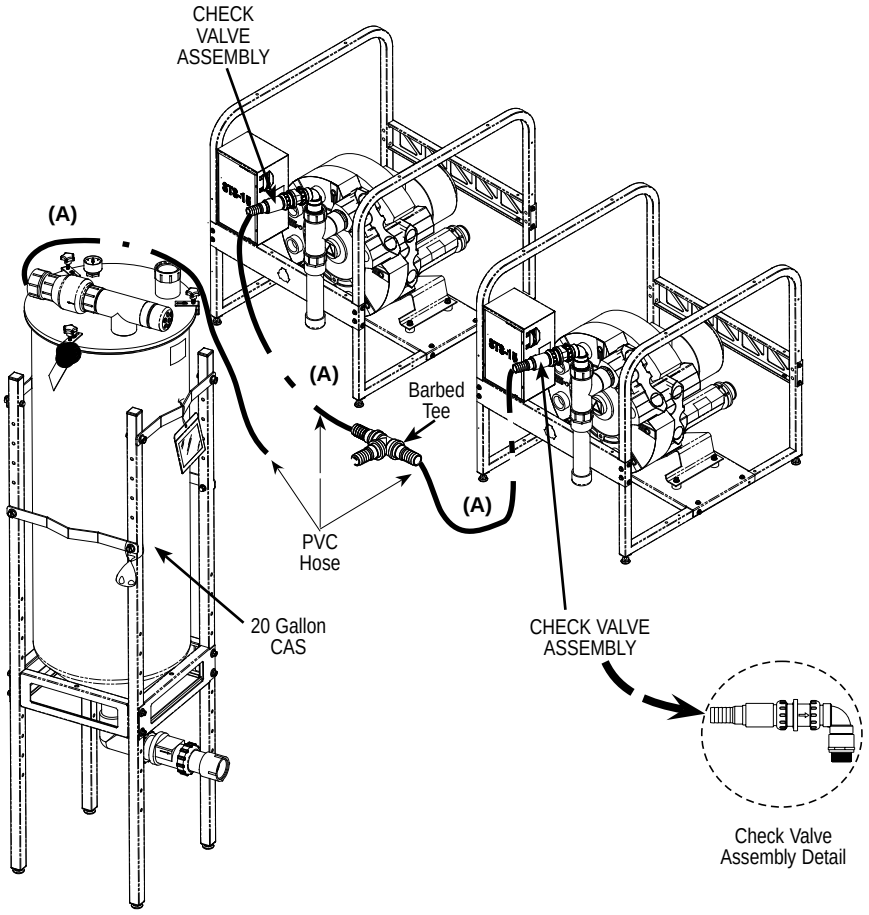


Figure 5. Pump Combining Using Dual SystemAccessory Kit, P/N 54400

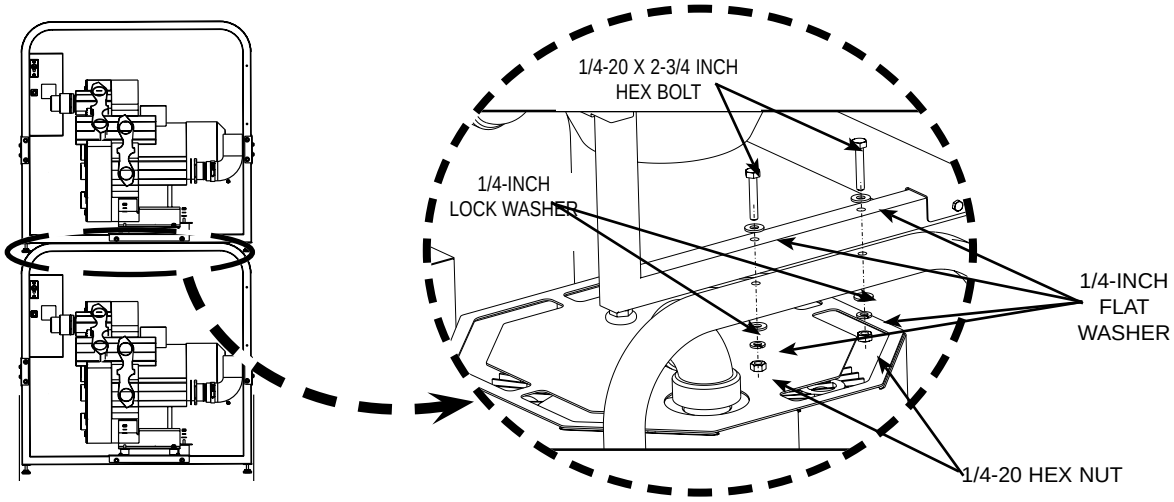


Figure 6. Stacking Two STS Pumps Hardware Detail

ELECTRICAL CONNECTIONS

Remove all power to the system prior to working within the electrical box.Contacting high voltage can cause serious injury or even death

All systems must be wired directly from an electrical box that complies with local electrical codes

Refer to Figure 7 when making STS-15 and STS-30 electrical connections. A Boost/Buck Transformer must be installed if the facility power is below the minimum 200V required prime input power.

Note: If the STS pump is spinning counter clockwise and producing pressure at the outlet, turn unit OFF and disconnect from power source. Switch any two of the three incoming power lines in the 4X4 Handy Box.

See INSTALLATION INFORMATION, page 8.

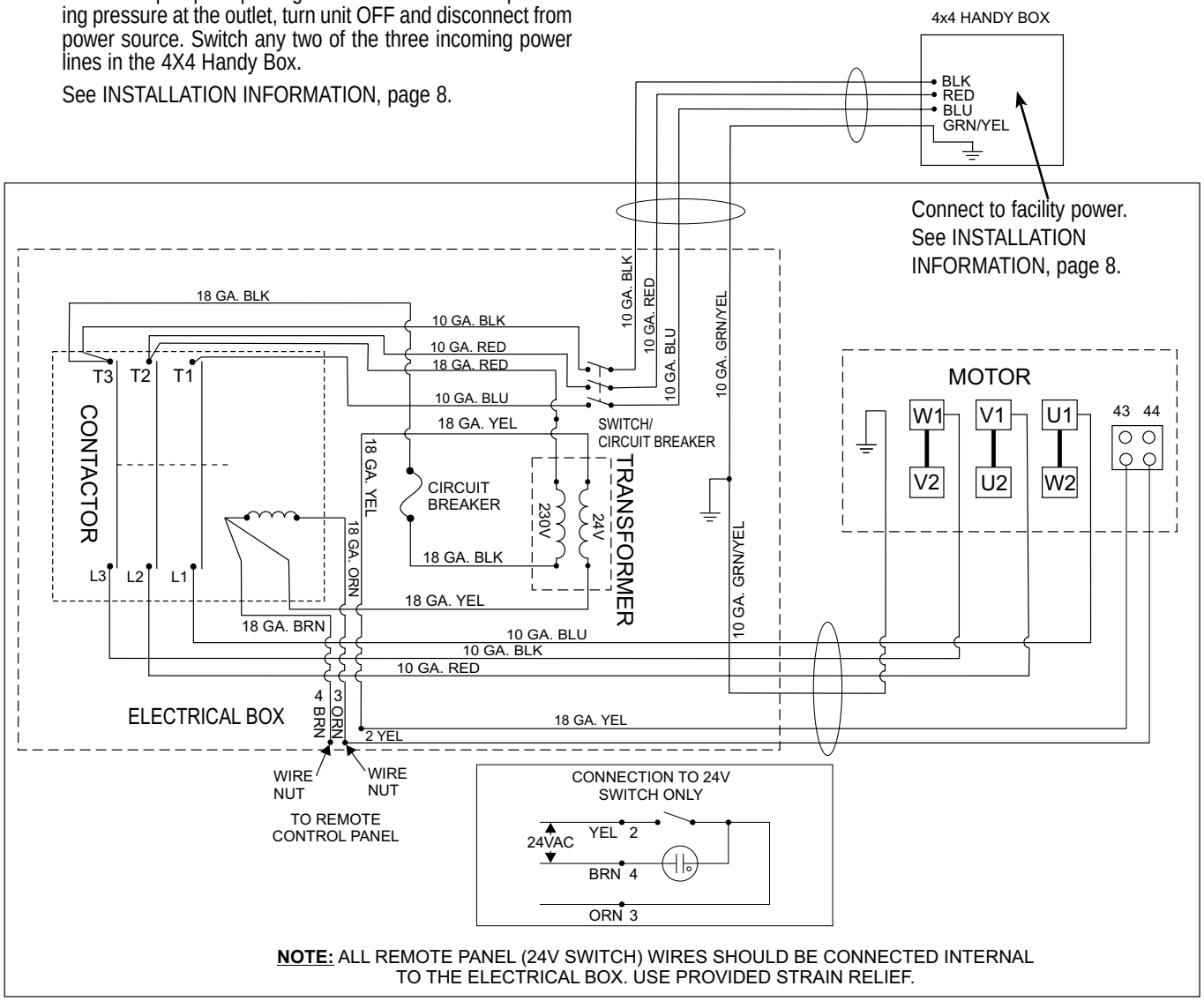


Figure 7. Electrical Schematic for STS-15 and STS-30

Warning: Cleaning agents that contain bleach or foam should not to be used in this system. These cleaners will leech mercury from amalgam and pollute our environment. Please use non-foaming, non leeching, and biodegradable Clean Stream (pn# 57850) for proper cleaning.

Initial Maintenance

After installation, clean the vacuum lines with Clean Stream Cleaner. This is especially necessary when a new system is being installed into existing dental system piping. Using Clean Stream Cleaner helps the STS system to remove any built up deposits in the piping system. Perform the initial cleaning by performing the daily maintenance procedure provided below.

Maintenance-Free STS Pumps

All STS pumps are designed for maintenance-free operation. The pump features a powerful permanent split capacitor motor, with a highly reliable contactor and powerful transformer. The motor is completely water and oil-free and provides a dependable operation requiring no scheduled maintenance.

Preventive Maintenance

Whenever a service technician fulfills a repair call at the customer site routine checks should also be performed to detect general overall wear, and replacement of parts should be made if necessary before a failure causes a prolonged shut-down. This preventive maintenance program will aid in dependable equipment operation and help reduce breakdown.

Scheduled Maintenance

Since a well-organized maintenance program aids dependable equipment operation and reduces breakdown to a minimum, it is essential that the maintenance instructions be followed completely. The routine cleaning will remove any built up deposits in the piping system and the tank inspection will verify proper drainage before a failure causes a prolonged shut-down.

Daily

1. Clean drain lines from the operatory to the Buffer tanks with Clean Stream Cleaner by performing the daily maintenance procedure provided next page.
2. Rinse out each tank with water via the wash-out fitting on the tank top cover

Yearly Inspection will verify proper drainage before a failure causes a prolonged shut-down. Perform yearly maintenance procedure provided below to inspect tank interior.

a. Check buildup at the base of the tank entering the drain.
b. Check for any evidence that liquids have reached the float assembly.

Important: Evidence of buildup at the base drain or liquids reaching the float assembly most likely means that a stricter adherence to the daily maintenance procedure is required.

If problems are found during tank inspection, perform the daily maintenance Tank Washout procedure as necessary to remove buildup at the base drain. Reinspect to verify proper tank drainage.

MAINTENANCE

Warning: The following steps must be performed while wearing skin and eye protection designed for handling typical Haz-Mat material. Use care at all times to prevent spillage.

Caution: Use only Clean Stream Cleaner to maintain the system vacuum lines. Do not use chlorine bleach or solutions of sodium hypochlorite to disinfect the STS system. These materials may result in damage or destruction of equipment or loss of system performance.

Daily Maintenance - Clean Vacuum Lines

Clean all vacuum lines in the vacuum system with Clean Stream Cleaner **daily** as part of the overall preventive maintenance program. This helps to maintain the cleanliness of the CAS tank as well as the vacuum lines and tubing throughout the system. Using the 2.5 liter bottle of Clean Stream Cleaner, PN 57850 and the Clean Stream dispenser system, PN 57665.

Required - Not Supplied

Part No.	Description
57850	2.5 Liter Bottle Clean Stream Cleaner (125 applications)
57665	Clean Stream Dispenser System 1 Bottle with o-rings and caps 1 Saliver Ejector Adapter 1 High-Volume Actuator Adapter 1 Small Suction Hose Adapter 1 Large Suction Hose Adapter

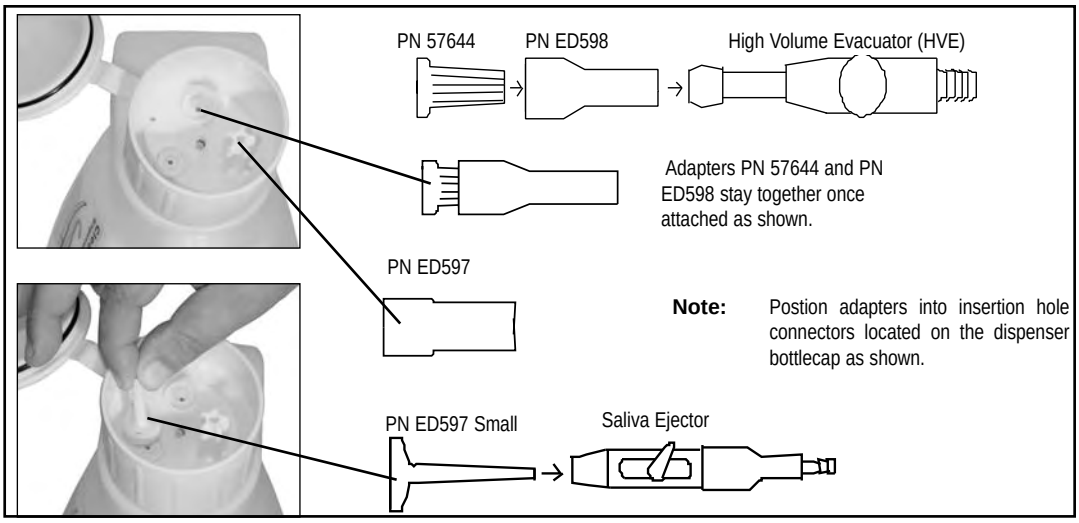
Part No. 57850

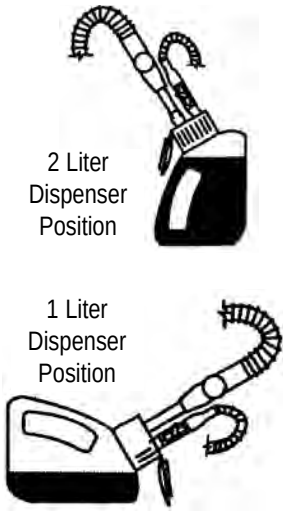
Clean Stream Dispenser System, Part No. 57665

Procedure. Prepare the cleaning solution and clean the system daily by performing the following steps.

Note: The Clean Stream Dispenser can hold a maximum of 2 liters of solution for cleaning up to 2 operatories. Mix solution quantity as necessary.

1. Fill the Clean Stream dispenser with tap water as applicable;
   a. to the line marked 1 L for 1 operatory
   b. to the line marked 2 L for 2 operatories
2. Using the 20ml measuring line in the Clean Stream Cleaner bottlecap, add the Clean Stream Cleaner concentrate to the dispenser as applicable;
   a. for 1 operatory, add 20ml of Clean Stream concentrate to the 1 liter of water
   b. for 2 operatories, add 40ml of Clean Stream concentrate to the 2 liters of water
3. As shown below, the interior of the Clean Stream dispenser bottlecap is configured with three holes for the insertion of HVEs and SEs via provided adapters as follows.
   a. attach saliva ejector to smallest atomizing adapter
   b. attach 1 or 2 high volume ejectors to respective adapter(s)
4. Refer to illustrations below and place dispenser in the 2-liter vertical position or the 1-liter horizontal position as necessary.
5. With the vacuum pump on and handpiece valves open, aspirate the Clean Stream solution from dispenser.
6. After each cleansing procedure, disconnect the handpieces and rinse the dispenser.
7. Record task completion on Operatory System Task Log provided on page 16.


PN 57644
PN ED598
High Volume Evacuator (HVE)
Adapters PN 57644 and PN ED598 stay together once attached as shown.
PN ED597
Note: Postion adapters into insertion hole connectors located on the dispenser bottlecap as shown.
PN ED597 Small
Saliva Ejector



Daily Maintenance Procedure - Tank Washout

Refer to Figure 8 and perform the procedures to remove any solids trapped in the CAS tank.

1. Turn OFF the power to the STS.
2. Remove the plug from the wash-out port fitting on the top cover of the CAS tank.
3. Connect the 3/8-inch tubing from the water supply to the CAS wash-out port fitting.
4. Turn the water on and run the water through the CAS for approximately 2 minutes.
5. Turn off the water making sure to completely close the water valve.
6. Prior to restarting the STS do one of the following:
   a. Leave the 3/8-inch tubing connected to the wash-out port fitting. Make sure water valve is completely closed.
   b. Disconnect 3/8-inch tubing from the wash-out port fitting and making sure to replace plug.

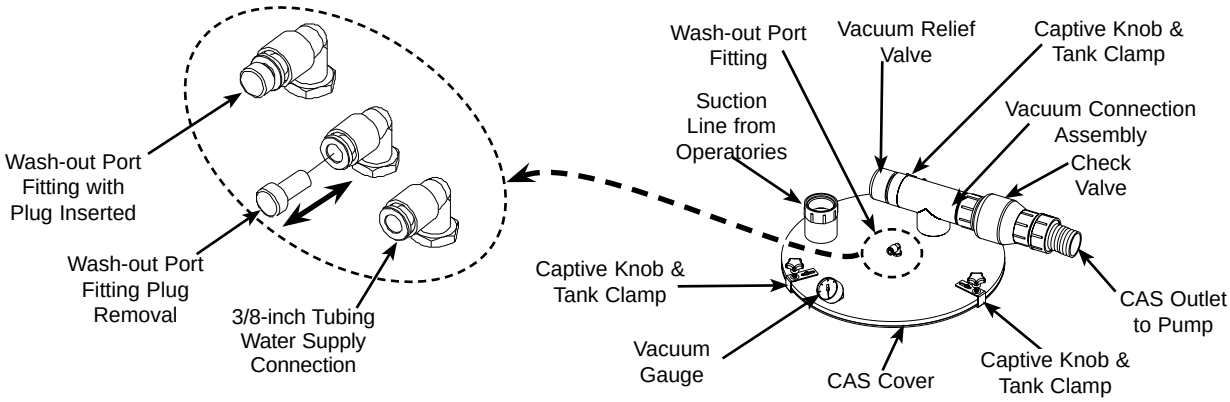


Figure 8. Stainless CAS Washout Port Detail

Yearly Maintenance Procedure - Tank Interior Inspection

1. Turn off the power to the CAS.
2. Loosen the 3 captive knobs holding the cover to the tank.
3. Carefully remove the cover ensuring that the gasket remains firmly attached to the tank flange.
4. Inspect tank interior for buildup at the base drain and/or any evidence that liquids have reached the float assembly.
5. Prior to replacing the cover, inspect the gasket to ensure a clean smooth surface.
6. Install cover and finger tighten the 3 captive knobs. Do not over tighten knobs.
7. Verify all hoses are securely connected.
8. Perform the daily maintenance Tank Washout procedure as necessary.

MAINTENANCE

Note: Make copies of the maintained logs as necessary to insure availability to record completion of maintenance task.

Operatory System Clean Task Log

Daily Clean	***Daily Clean***	***Daily Clean***	***Daily Clean***	***Daily Clean***	***Daily Clean***	***Daily Clean***	***Daily Clean***	***Daily Clean***	***Daily Clean***
Date	Date	Date	Date	Date	Date	Date	Date	Date	Date
Initial	Initial	Initial	Initial	Initial	Initial	Initial	Initial	Initial	Initial

Over or under adjustment of the Vacuum Relief Valve can degrade overall system operation. Adjustments should only be made to keep the suction level at the factory-set 10 InHg level, which is adequate to provide optimum operation.

Vacuum Relief Valve Adjustment

The STS system vacuum level is factory set at 10 InHg (inches of Mercury) as shown by the Vacuum Gauge. This suction level is more than adequate to provide a properly sized system service for a multiple-user dental facility. Whenever the suction level varies above or below the factory set point, adjustments can be made as necessary via the Vacuum Relief Valve. Refer to Figure 9 and adjust the system suction level by performing the following:

1. Access Vacuum Relief Valve by removing Vacuum Relief Valve Cap from the Vacuum Connection Assembly.
2. Hold Adjusting Nut with a 7/16-inch open-end wrench.
3. Using a flat screwdriver, adjust suction level as follows:
   a. Increase suction by turning adjusting screw clockwise in no more than 1/4 increments.
   b. Decrease suction by turning adjusting screw counterclockwise in no more than 1/4 increments.

Vacuum Relief Valve Cleaning

A dirty or clogged Vacuum Relief Valve degrades the STS system suction level. Clean the Vacuum Relief Valve by removing Vacuum Relief Valve Cap and carefully pulling the valve from the Vacuum Connection Assembly. Blow out accumulated solid deposits using clean low pressure compressed air.

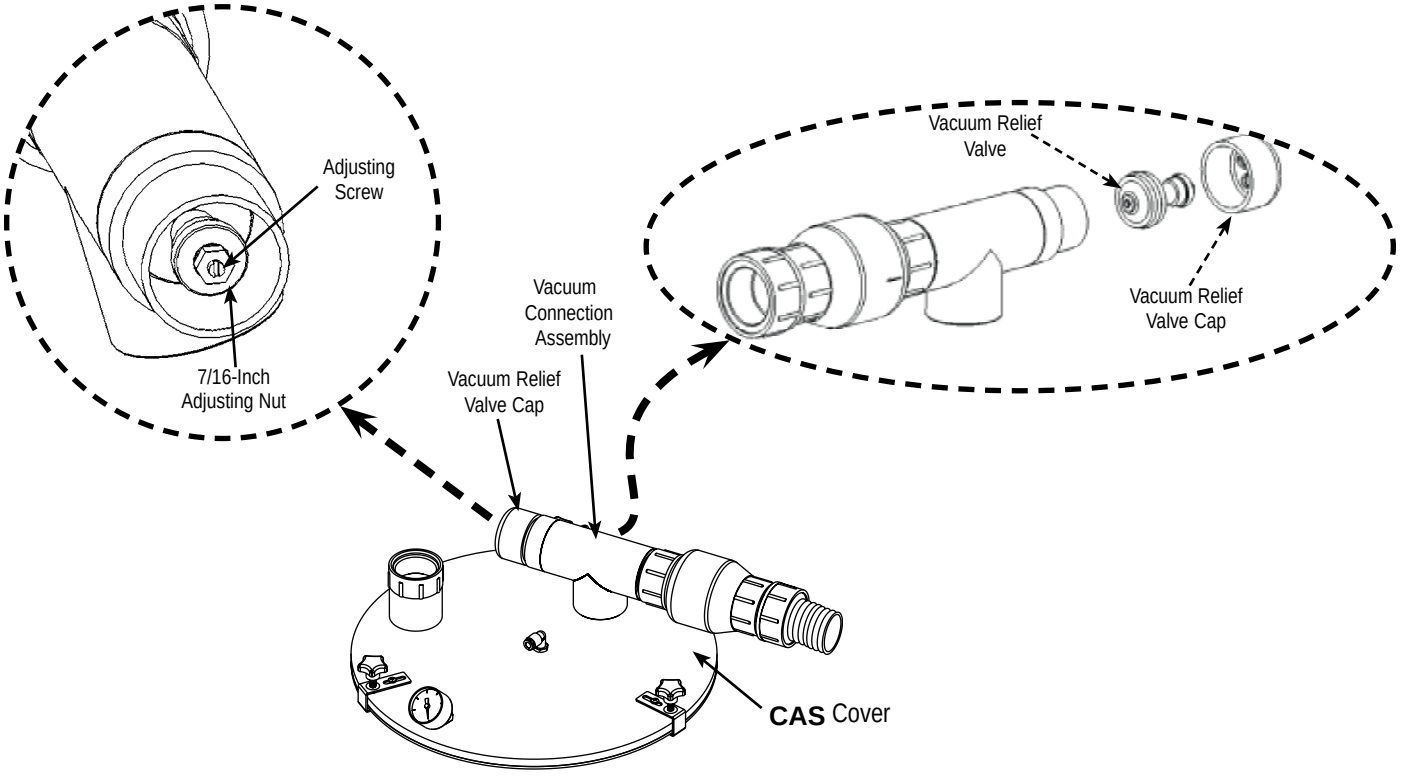


Figure 9. Vacuum Relief Valve Adjustment and Cleaning Detail

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTIONS
No suction.	a. Pump not turned on.	a. Turn pump on..
	b. Pump not running.	b. Call your authorized Air Techniques dealer for repair service.
	c. CAS separator tank full.	c. Shut unit “OFF” for 10 seconds then turn back “ON”.
	d. CAS hooked up backwards.	d. Connect hose from STS to swivel tee fitting on CAS.
	e. Drain check valve clogged.	e. Call your authorized Air Techniques dealer for repair service.
	f. Clogged drain.	f. Call your local plumber.
	g. Kinked or collapsed suction hose.	g. Check the suction line from the unit to the separation tank and the separation tank to the operatory line. If clogged, collapsed or kinked call your authorized Air Techniques dealer for repair service.
	h. Separator tank is full and will not drain.	h. Tank must be hooked up to an open drain. If hooked to an open drain and tank won't drain call your authorized Air Techniques dealer for repair service.
2. Poor or low suction	a. Restricted air exhaust.	a. Check air exhaust pipe to make sure it conforms to specifications. Check and clear possible restrictions in exhaust line.
	b. Restricted air suction.	b. Check the suction line from the unit to the separation tank and the separation tank to the operatory line. If clogged , collapsed or kinked call your authorized Air Techniques dealer for repair service.
3. Excessive suction	a. Relief valve set high or stuck closed.	a. Call your authorized Air Techniques dealer for repair service.
	b.Relief valve screen clogged.	b. Call your authorized Air Techniques dealer for repair service.
4. Pump does not run.	a. Site circuit breaker is “OFF”.	a. Turn “ON” the site circuit breaker.
	b. Pump circuit breaker is “OFF”.	b. Turn “ON” the pump circuit breaker.
	c. Low voltage circuit breaker is open.	c. If the white section of the circuit breaker is visible, it is tripped. Flip this section back in to reset breaker.
	d. Low voltage remote switch turned “OFF”, or not connected properly.	d. Make sure remote switch is turned “ON” or if not using remote, switch yellow and orange wires twisted together.
	e. Electrical problem.	e. Call your authorized Air Techniques dealer for repair service.

ACCESSORIES/OPTIONS

Accessories/Equipment Options. The following lists the ordering number and description for accessory components available to maintain the STS product family. Contact an authorized Air Techniques’ dealer for information.

Part No.	Description
54075	Kit, CAS Replacement Cover
54061	Kit, Washout Connector
54199	Kit, Remote Vacuum Relief Valve Assembly
54360	Pre-Installation Guide, STS and CAS
54400	Installation Kit, Dual System
56200	Vacuum Equalizer
54360	Pre-Installation Guide, STS and CAS (with Heat Exchanger Installed)
54514	Pre-Installation Guide, STS and CAS (No Heat Exchanger)

STS™ Pump Accessory Pack; P/N 54468, Contents -

Part No.	Component Description	Quantity
57253	Barbed Adapter, 1-1/2-Inch MNPT by 1-1/2 Inch	1
56057	2 1/4-Inch Diameter Hose, 17 Inch Long,1 Inch Wide Cuff	1
89324	Hose Clamp, 1-9/16- 2-1/2 Inch Maximum by 1/2 Inch	2
57234	1-1/2-Inch Street Elbow 1-1/2 Inches NPT	1
57169	1.31 to 2.25-Inch Diameter Hose Clamp	1
54105	STS User's Manual	1

CAS Tank Accessory Pack; P/N 54135, Contents -

Part No.	Component Description	Quantity
54118	1-1/2 Diameter; Black PVC Hose	15 FT
57169	1.31 to 2.25-Inch Diameter Hose Clamp	5
57253	Barbed Adapter,1-1/2-Inch MNPT X 1-1/2 Inch	4
57234	1-1/2-Inch Street Elbow 1-1/2" NPT	1
31453	1/4-20 X 1-3/4-Inch HEX Head Bolt, Grade 5	4
30610	1/4-Inch Plated Flat Washer	12
30222	1/4-Inch Plated Split Lock Washer	4
30049	1/4-20,Plated HEX Nut	4
A1028	Right-Hand Side CAS Tank Bracket	1
A1029	Left-Hand Side CAS Tank Bracket	1
30124	1/4 X 2-Inch,HEX Head Lag Bolt	4

STS™ Dual System Accessory Kit; P/N 54400, Contents -

Part No.	Component Description	Quantity
54129	Check Valve; 1-1/4 Inch to 1-1/2 Inch, Modified. Includes: Connector Adapter, 54234 PVC Pipe Length, 54291 Barbed P Connector Adapter, 57253	2
54128	PVC Tee PCONN, 1-1/2 Inch FNPT All Sides: D. Includes: Barbed P Connector Adapter, 57253	1
55222	PVC P Connector Adapter, 1-1/2 Inch MNPT X 1-1/2 Inch SPG	2
54118	1-1/2 Diameter; Black PVC Hose	6 FT
57169	Hose Clamp, 1.31 - 2.25 Inch Diameter.	5
31454	1/4-20 X 2-3/4-Inch,HEX Head Bolt, Grade 5, Plated	4
30958	1/4-Inch Flat Washer,18-8 ST	8
30920	1/4-Inch Split Lock Washer,18-8 ST	4
30049	1/4-20, Plated HEX Nut	4
54069	Instruction, Dual System Assembly	1

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